OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **ISLAND POND, WASHINGTON** the program coordinators recommend the following actions.

Welcome to the New Hampshire Volunteer Lake Assessment Program! As you continue your participation in VLAP the database you create for your water body will help you track trends in lake quality and identify potential problems. As a rule of thumb, try to sample once per month during the summer. Other special sampling programs include monitoring for non-point sources of pollution to the lake, and more frequent, long-term sample collection to establish a complex data set of your lake's water quality. We understand that future sampling will depend upon volunteer availability, water monitoring goals, and funding. **Trend analysis is not feasible with only a few data points.** It can take a few years of data collection to obtain an adequate set of baseline data. Frequent and consistent sampling will ensure useful data for future analyses. Contact the VLAP Coordinator this spring to schedule our annual lake visit. If your group feels they need a refresher in sampling techniques, call us early to make an appointment. Please consult the Interpreting Data and Monitoring Parameters sections of this report when trying to understand data.

FIGURE INTERPRETATION

- Figure 1: These graphs illustrate concentrations of chlorophyll-a, also a measure of algal abundance, in the water column. Algae are microscopic plants that are a natural part of lake ecosystems. Algae contain chlorophyll-a, a pigment necessary for photosynthesis. A measure of chlorophyll-a can indicate the abundance of algae in a lake. The current year data (the bottom graph) show in-lake chlorophyll-a concentrations are lower than the state mean. We will watch for this trend to continue in the future. While algae are present in all lakes, an excess amount of any type is not welcomed. Concentrations can increase when there are external and internal sources of phosphorus, which is the nutrient algae depend upon for growth. It's important to continue the education process and keep residents aware of the sources of phosphorus and how it influences lake quality.

- Figure 2: Water clarity is measured by using a Secchi disk. Clarity, or transparency, can be influenced by such things as algae, sediments from erosion, and natural colors of the water. The graphs on this page show historical and current year data. The upper graph shows in-lake transparency is well above the state mean. The clarity at Island Pond is nearly twice that of New Hampshire's average! This is an excellent reading that we hope will persist in the future. The 2000 sampling season was considered to be wet and, therefore, average transparency readings are expected to be slightly lower than last year's readings. Higher amounts of rainfall usually cause more eroding of sediments into the lake and streams, thus decreasing clarity.

- Figure 3: These figures show the amounts of phosphorus in the epilimnion (the upper layer in the lake) and the hypolimnion (the lower layer); the inset graphs show current year data. Phosphorus is the limiting nutrient for plants and algae in New Hampshire waters. Too much phosphorus in a lake can lead to increases in plant growth over time. These graphs show in-lake phosphorus levels are very low; both layers have concentrations that are half of the state median. One of the most important approaches to reducing phosphorus levels is educating the public. Humans introduce phosphorus to lakes by several means: fertilizing lawns, septic system failures, and detergents containing phosphates are just a few. Keeping the public aware of ways to reduce the input of phosphorus to lakes means less productivity in the lake. Contact the VLAP coordinator for tips on educating your lake residents or for ideas on testing your watershed for phosphorus inputs.

OTHER COMMENTS

- Dissolved oxygen was high throughout the middle layer of the lake (Table 9). Dissolved oxygen levels were lower in the bottom two meters. As lakes age, oxygen is depleted in the lower layer by the process of decomposition. The lack of this aging indicator is a sign of the lake's overall health. We would encourage you to schedule a visit by our Coordinator for the beginning of the summer of 2001 so we can compare the difference in dissolved oxygen from the end of the summer. Dissolved oxygen can be depleted later in the summer. It would be interesting to evaluate the levels during the early summer.

- The Acid Neutralizing Capacity (ANC) value was very low this summer (Table 5). ANC values determine how susceptible a lake is to the addition of acid through acid rain or other means. There is probably little that can be done to reverse this problem. However, the Washington Lake Association can begin sampling at least once a month during the summer to establish a good set of baseline data. More data allows the biologists at DES to better understand the conditions in your lake.

- Conductivity concentrations were very low in and around Island Pond this year (Table 6). Conductivity was particularly low this year throughout the state, most likely as a result of the excess rains, which tend to flush out any pollutants. Conductivity increases often indicate the influence of human activities on surface waters. This decreasing trend is a positive sign. Septic system leachate, agricultural runoff, iron deposits, and road runoff can all influence conductivity.

- The total phosphorus values of the inlets and near shore stations were all relatively low with one exception (Table 8). The Boathouse Inlet total phosphorus value was in the high range of values (see the Chemical Monitoring Parameters Section of the report) for New Hampshire lakes. The part of the inlet where the sample was taken was stagnant, which could have skewed the results. One town resident mentioned a part of the inlet slightly upstream that would possibly produce more accurate results. In the future, try to avoid sampling waters that are stagnant or too shallow.

- *E.coli* originates in the intestines of warm-blooded animals (including humans) and is an indicator of associated and potentially harmful pathogens. Bacteria concentrations were all very low at the sites tested (Table 12). If residents are concerned about septic system impacts, testing when the water table is high or after rains is best. Please read the Other Monitoring Parameters section of the report for state standards for *E. coli*.

NOTES

- Monitor's Note (8/28/00): Boathouse Inlet stagnant.

USEFUL RESOURCES

A Boater's Guide to Cleaner Water, NHDES pamphlet, (603) 271-3503 or

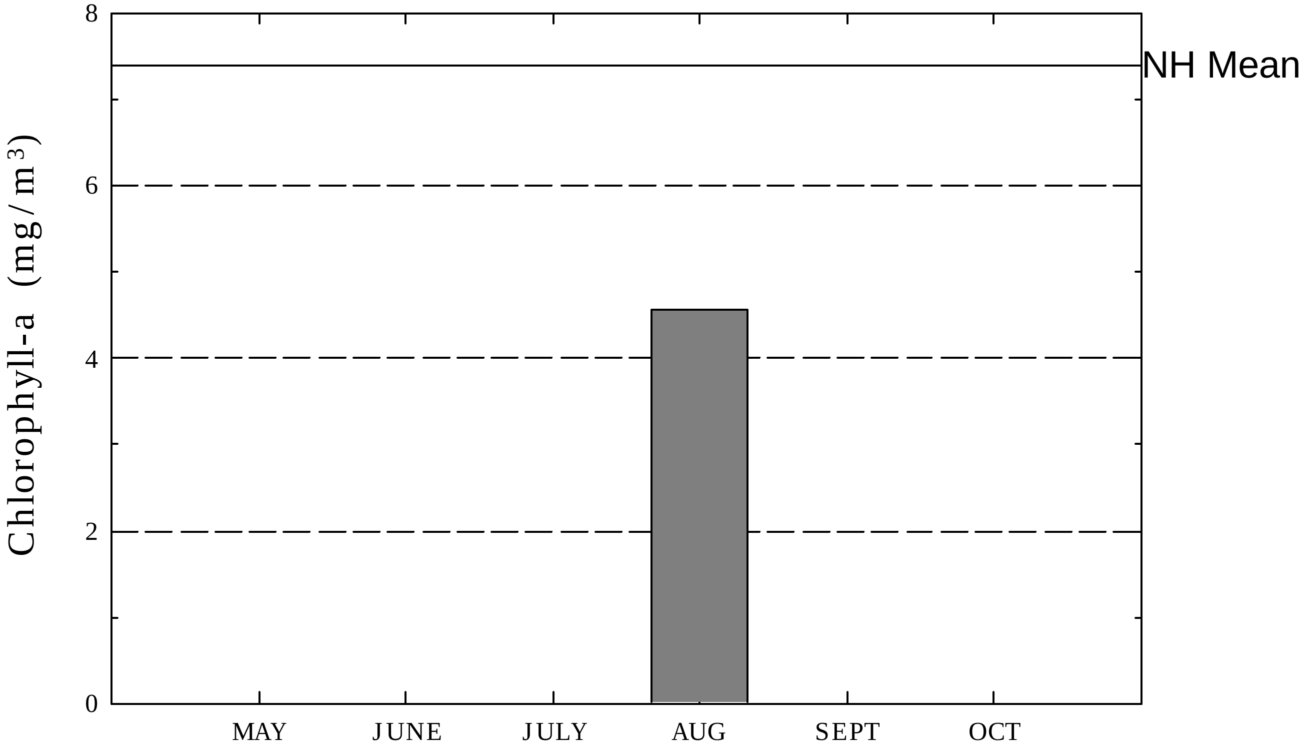
Through the Looking Glass: A Field Guide to Aquatic Plants. North American Lake Management Society, 1988. (608) 233-2836 or www.nalms.org

What is a Watershed?, NH Lakes Association pamphlet, (603) 226-0299 or www.nhlakes.org

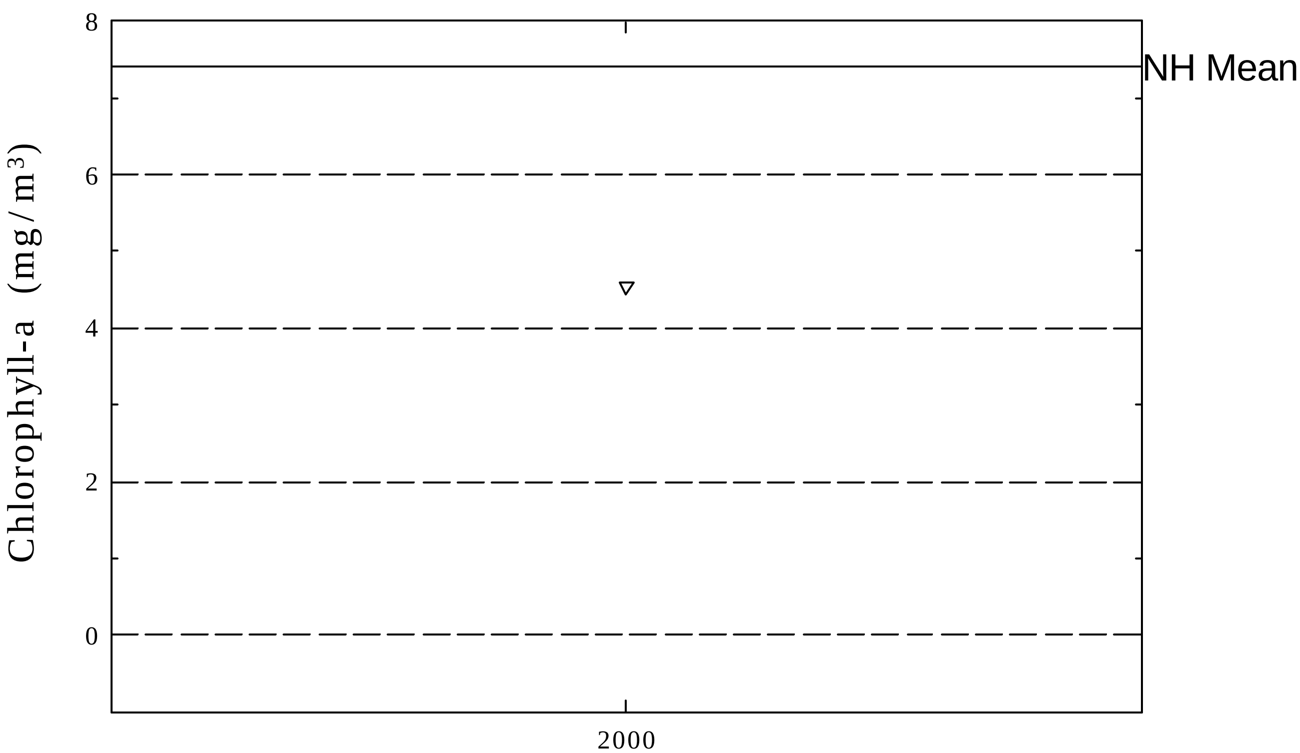
Vermont Better Backroads Manual: Clean Water You Can Afford. Windham, VT Regional Commission, 1995.

Island Pond, Washington

Figure 1. Monthly and Historical Chlorophyll-a Results



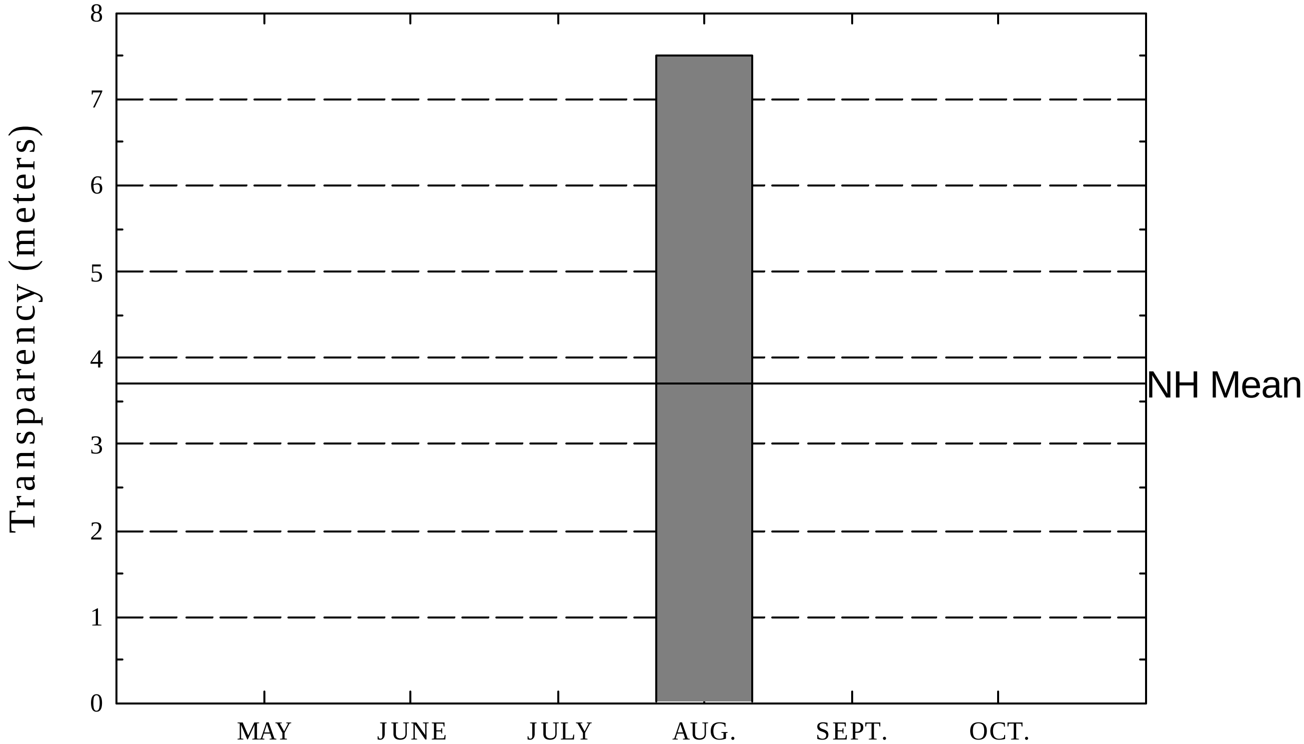
2000 Chlorophyll-a Results



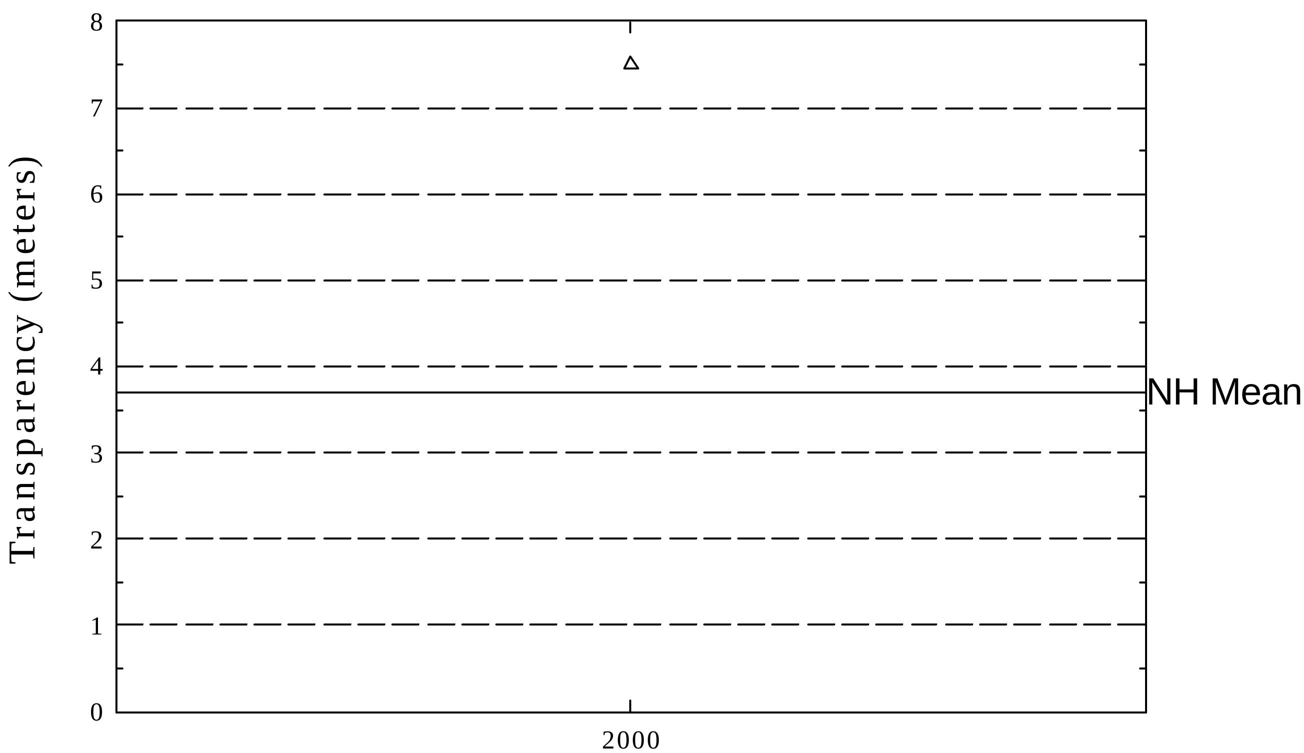
Historical Chlorophyll-a Results

Island Pond, Washington

Figure 2. Monthly and Historical Transparency Results



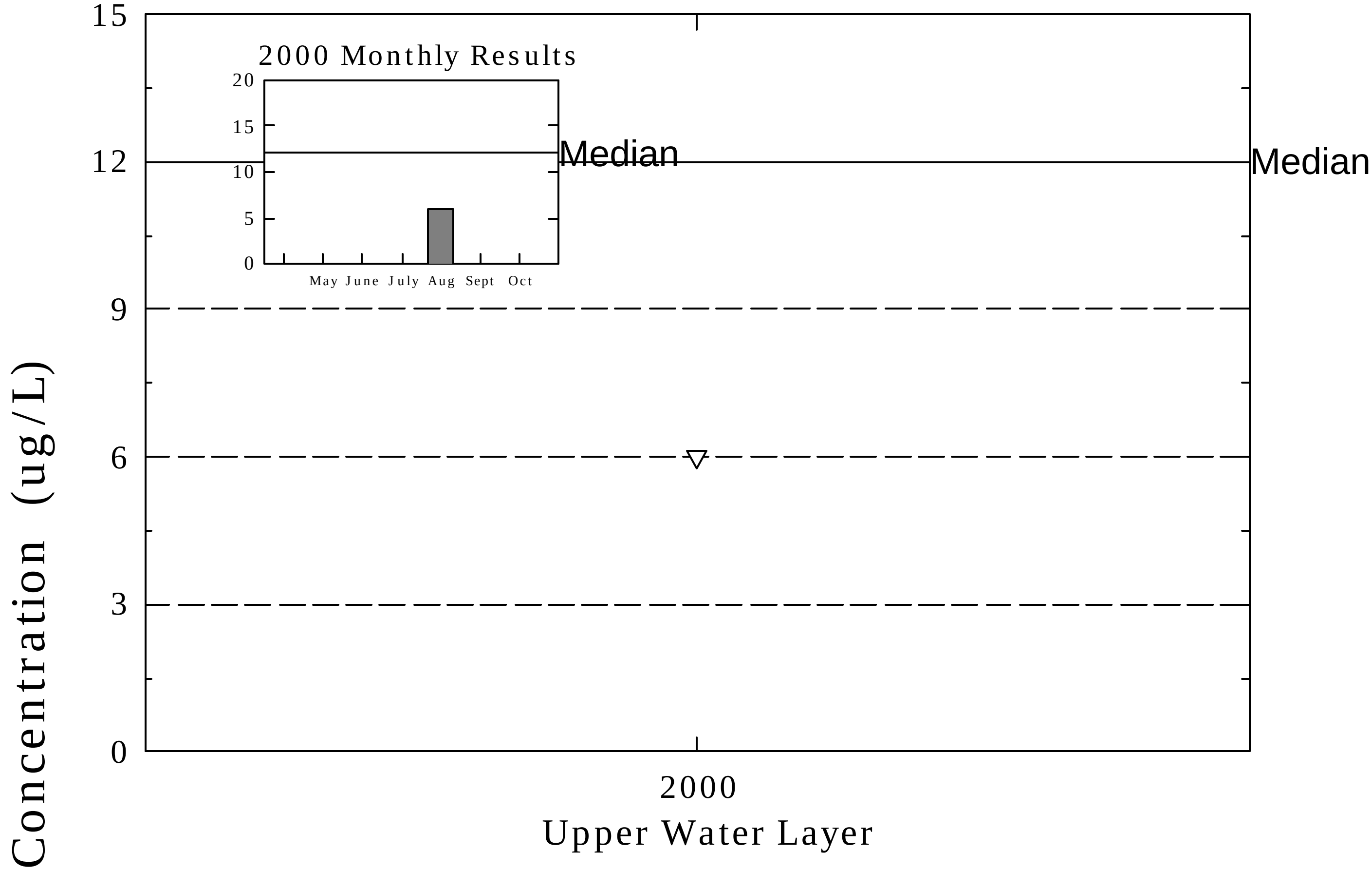
2000 Transparency Results



Historical Transparency Results

Island Pond, Washington

Figure 3. Monthly and Historical Total Phosphorus Data.



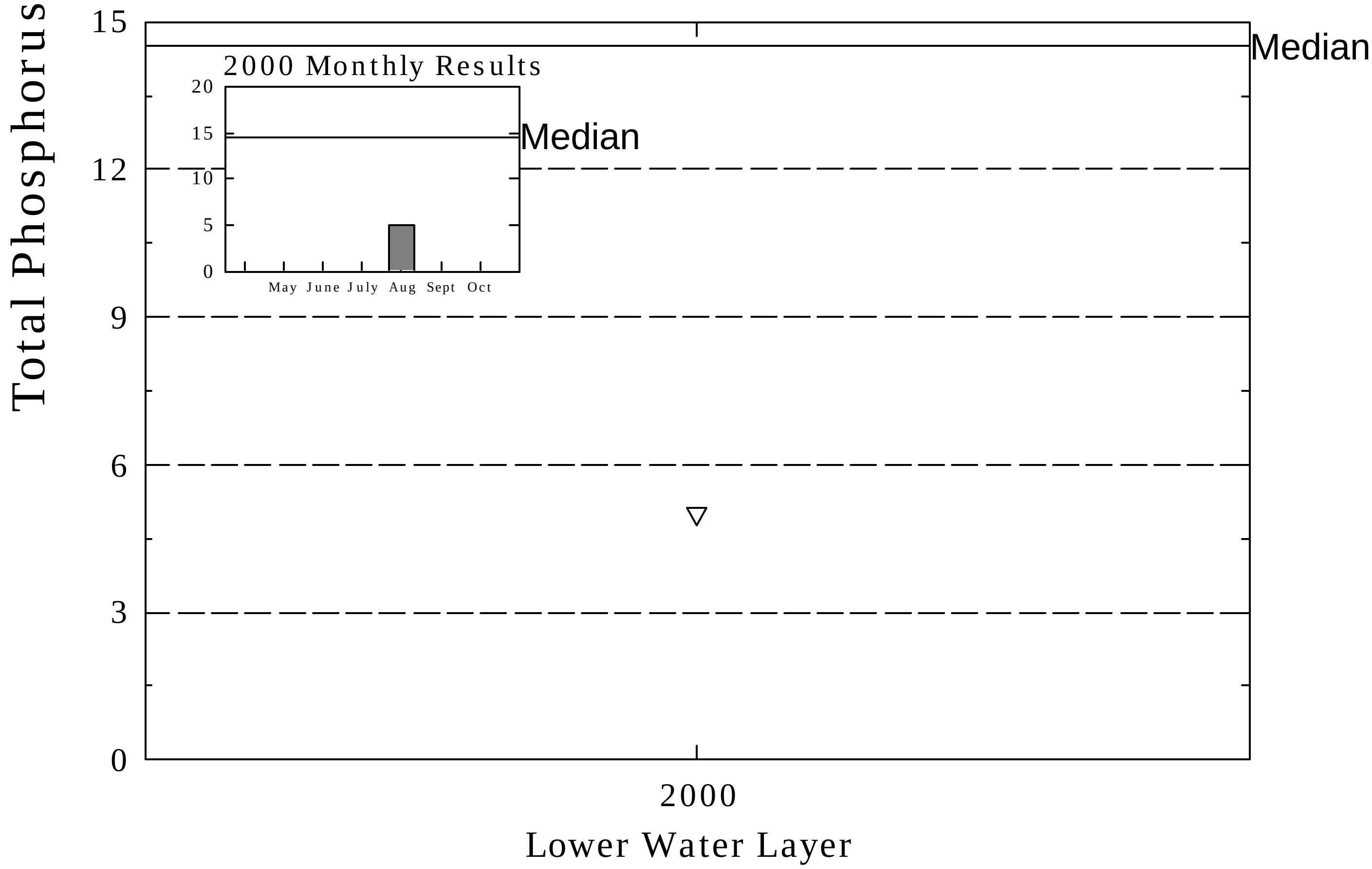


Table 1.

ISLAND POND

WASHINGTON

Chlorophyll-a results (mg/m^3) for current year and historical sampling periods.

Year	Minimum	Maximum	Mean
2000	4.55	4.55	4.55

Table 2.

ISLAND POND

WASHINGTON

Phytoplankton species and relative percent abundance.

Summary for current and historical sampling seasons.

Date of Sample	Species Observed	Relative % Abundance
08 / 28 / 2000	DINOBRYON	80
	UROGLENOPSIS	10
	RHIZOSOLENIA	5

Table 3.

ISLAND POND

WASHINGTON

Summary of current and historical Secchi Disk transparency results (in meters).

Year	Minimum	Maximum	Mean
2000	7.5	7.5	7.5

Table 4.

ISLAND POND
WASHINGTON

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
BOATHOUSE INLET				
	2000	5.47	5.47	5.47
BODNARS COVE				
	2000	6.07	6.07	6.07
DAM OUTLET				
	2000	6.19	6.19	6.19
EPILIMNION				
	2000	6.15	6.15	6.15
HYPOLIMNION				
	2000	5.55	5.55	5.55
JOURNEYS END INLET				
	2000	6.51	6.51	6.51
METALIMNION				
	2000	5.51	5.51	5.51

Table 5.

ISLAND POND

WASHINGTON

Summary of current and historical Acid Neutralizing Capacity.
Values expressed in mg/L as CaCO .

Epilimnetic Values

Year	Minimum	Maximum	Mean
2000	1.40	1.40	1.40

Table 6.

ISLAND POND
WASHINGTON

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
BOATHOUSE INLET				
	2000	51.0	51.0	51.0
BODNARS COVE				
	2000	44.7	44.7	44.7
DAM OUTLET				
	2000	44.9	44.9	44.9
EPILIMNION				
	2000	44.5	44.5	44.5
HYPOLIMNION				
	2000	48.7	48.7	48.7
JOURNEYS END INLET				
	2000	24.9	24.9	24.9
METALIMNION				
	2000	48.7	48.7	48.7

Table 8.

ISLAND POND
WASHINGTON

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
BOATHOUSE INLET				
	2000	21	21	21
BODNARS COVE				
	2000	< 5	5	5
DAM OUTLET				
	2000	5	5	5
EPILIMNION				
	2000	6	6	6
HYPOLIMNION				
	2000	5	5	5
JOURNEYS END INLET				
	2000	6	6	6
METALIMNION				
	2000	6	6	6

Table 9.

ISLAND POND
WASHINGTON

Current year dissolved oxygen and temperature data.

Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
August 28, 2000			
0.1	22.4	8.0	92.5
1.0	22.1	8.0	91.2
2.0	21.2	8.1	91.4
3.0	20.5	8.1	90.0
4.0	20.0	7.9	86.7
5.0	19.7	7.8	85.5
6.0	18.4	7.5	79.3
7.0	13.1	4.3	40.6
8.0	10.3	5.3	46.9
9.0	8.6	5.5	47.1
10.0	7.5	4.7	39.0
11.0	7.1	4.3	35.8
12.0	6.9	4.2	34.9
13.0	6.7	3.4	28.1
14.0	6.4	1.1	8.7
15.0	6.4	0.9	7.6

Table 10.

ISLAND POND

WASHINGTON

Historic Hypolimnetic dissolved oxygen and temperature data.

Date	**Depth** (meters)	**Temperature** (celsius)	**Dissolved Oxygen** (mg/L)	**Saturation** (%)
August 28, 2000	15.0	6.4	0.9	7.6

Table 11.

ISLAND POND

WASHINGTON

Summary of current year and historic turbidity sampling.
Results in NTU's.

Station	Year	Minimum	Maximum	Mean
BOATHOUSE INLET				
	2000	0.6	0.6	0.6
BODNARS COVE				
	2000	0.2	0.2	0.2
DAM OUTLET				
	2000	0.3	0.3	0.3
EPILIMNION				
	2000	0.2	0.2	0.2
HYPOLIMNION				
	2000	0.3	0.3	0.3
JOURNEYS END INLET				
	2000	0.5	0.5	0.5
METALIMNION				
	2000	0.5	0.5	0.5

Table 12.

ISLAND POND

WASHINGTON

Summary of current year bacteria sampling.
Results in counts per 100ml.

Location	Date	E. Coli See Note Below
BEACH		
	August 28	0
BODNARS COVE		
	August 28	0

NOTE: "<" means "less than" and ">" means "greater than"